channels being defined to comprise information channels and control channels, the downlink logical channels using the downlink time slots; and

defining uplink logical channels from a mobile station to a base station, the uplink logical channels being defined to comprise information channels reserved for information transmission and a reservation request channel (R), on which the mobile station requests the reservation of a connection for transmitting packet data, the uplink logical channels using the uplink time slots; wherein

in the TDMA frames a number of the uplink logical channels and downlink logical channels are allocated for packet data transmission, each uplink logical channel having a variable number of uplink time slots and each downlink logical channel having a variable number of downlink time slots, the number of allocated time slots in each logical channel being a function of one of a symmetricity and an asymmetricity of the packet data transmission.

41. A method for transmitting packet data in the air interface of a digital cellular system based on time division multiple access (TDMA) having uplink and downlink time slots a plurality of which comprise an uplink and a downlink TDMA frame, respectively, comprising the steps of:

defining downlink logical channels from a base station to a cell served by the base station, the downlink logical channels being defined to comprise information channels

and control channels, the downlink logical channels using the downlink time slots; and

defining uplink logical channels from a mobile station to a base station, the uplink logical channels being defined to comprise information channels reserved for information transmission and a reservation request channel (R), on which the mobile station requests the reservation of a connection for transmitting packet data, the uplink logical channels using the uplink time slots; wherein

in the TDMA frames a number of the uplink logical channels and downlink logical channels are allocated for packet data transmission, each uplink logical channel having a variable number of uplink time slots and each downlink logical channel having a variable number of downlink time slots, the number of allocated time slots in each logical channel being a function of one of a symmetricity and an asymmetricity of the packet data transmission;

for packet data transmission there are reserved n time slots, one of which is reserved for transmitting control information and packet data and the other of which is reserved solely for transmitting the packet data.

43. A method for transmitting packet data in the air interface of a digital cellular system based on time division multiple access (TDMA) having uplink and downlink time slots a plurality of which comprise an uplink and a downlink TDMA frame, respectively, comprising the steps of:

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defining downlink logical channels from a base station to a cell served by the base station, the downlink logical channels being defined to comprise information channels and control channels, the downlink logical channels using the downlink time slots; and

defining uplink logical channels from a mobile station to a base station, the uplink logical channels being defined to comprise information channels reserved for information transmission and a reservation request channel (R), on which the mobile station requests the reservation of a connection for transmitting packet data, the uplink logical channels using the uplink time slots; wherein

in the TDMA frames a number of the uplink logical channels and downlink logical channels are allocated for packet data transmission, each uplink logical channel having a variable number of uplink time slots and each downlink logical channel having a variable number of downlink time slots, the number of allocated time slots in each logical channel being a function of one of a symmetricity and an asymmetricity of the packet data transmission;

for the case where the transmission is symmetric and is originated by or terminated by the mobile station, only data packets are transmitted in one direction, and only acknowledgements are transmitted in the opposite direction.

58. A method for transmitting packet data in the air interface of a digital cellular system based on time division

multiple access (TDMA) having uplink and downlink time slots a plurality of which comprise an uplink and a downlink TDMA frame, respectively, comprising the steps of:

defining downlink logical channels from a base station to a cell served by the base station, the downlink logical channels being defined to comprise information channels and control channels, the downlink logical channels using the downlink time slots; and

defining uplink logical channels from a mobile station to a base station, the uplink logical channels being defined to comprise information channels reserved for information transmission and a reservation request channel (R), on which the mobile station requests the reservation of a connection for transmitting packet data, the uplink logical channels using the uplink time slots; wherein

in the uplink and the downlink TDMA frames a number of the uplink logical channels and downlink logical channels are allocated for packet data transmission, each uplink logical channel having a variable number of uplink time slots and each downlink logical channel having a variable number of downlink time slots, the respective number of allocated uplink time slots in an uplink logical channel and downlink time slots in a downlink logical channel being one of an equal number and an unequal number, in dependence upon the demand for packet data transmission in the uplink direction and respectively upon the demand for packet data transmission in the downlink direction.

60. A method for transmitting packet data in the air interface of a digital cellular system based on time division multiple access (TDMA) having uplink and downlink time slots a plurality of which comprise an uplink and a downlink TDMA frame, respectively, comprising the steps of:

defining downlink logical channels from a base station to a cell served by the base station, the downlink logical channels being defined to comprise information channels and control channels, the downlink logical channels using the downlink time slots; and

defining uplink logical channels from a mobile station to a base station, the uplink logical channels being defined to comprise information channels reserved for information transmission and a reservation request channel (R), on which the mobile station requests the reservation of a connection for transmitting packet data, the uplink logical channels using the uplink time slots; wherein

in the uplink and the downlink TDMA frames a number of the uplink logical channels and downlink logical channels are allocated for packet data transmission, each uplink logical channel having a variable number of uplink time slots and each downlink logical channel having a variable number of downlink time slots, the respective number of allocated uplink time slots in an uplink logical channel and downlink time slots in a downlink logical channel being one of an equal number and an unequal number, in dependence upon the demand for packet data transmission in

the uplink direction and respectively upon the demand for packet data transmission in the downlink direction;

for packet data transmission there are reserved n time slots, one of which is reserved for transmitting control information and packet data and the other of which is reserved solely for transmitting the packet data.

62. A method for transmitting packet data in the air interface of a digital cellular system based on time division multiple access (TDMA) having uplink and downlink time slots a plurality of which comprise an uplink and a downlink TDMA frame, respectively, comprising the steps of:

defining downlink logical channels from a base station to a cell served by the base station, the downlink logical channels being defined to comprise information channels and control channels, the downlink logical channels using the downlink time slots; and

defining uplink logical channels from a mobile station to a base station, the uplink logical channels being defined to comprise information channels reserved for information transmission and a reservation request channel (R), on which the mobile station requests the reservation of a connection for transmitting packet data, the uplink logical channels using the uplink time slots;

in the uplink and the downlink TDMA frames a number of the uplink logical channels and downlink logical channels are allocated for packet data transmission, each uplink

logical channel having a variable number of uplink time slots and each downlink logical channel having a variable number of downlink time slots, the respective number of allocated uplink time slots in an uplink logical channel and downlink time slots in a downlink logical channel being one of an equal number and an unequal number, in dependence upon the demand for packet data transmission in the uplink direction and respectively upon the demand for packet data transmission in the downlink direction;

for the case where the transmission is symmetric and is originated by or terminated by the mobile station, only data packets are transmitted in one direction, and only acknowledgements are transmitted in the opposite direction.

REMARKS

Applicants thank the Examiner for the allowance of claims 1-20, 23, 25-38, 42, 44-57, 61, 63 and 66.

Entry and consideration of this Amendment is respectfully requested. Although the Office Action of May 24, 2000 is final, it is respectfully submitted that the present amendment should be considered. Specifically, Applicants acknowledge the relevance of the Shepherd et al. patent and believe that it should have been cited in the previous Office Action to provide Applicants with an opportunity to adequately consider Shepherd et al. and to patentably distinguish the claims. Thus, it is respectfully requested that the Examiner consider

the amendments to the rejected independent claims which it is submitted serve to patentably distinguish from Shepherd et al.

Clams 39, 40, 21, 41, 22, 43, 24, 58, 59, 64, 60, 65, 62 and 67 were rejected under 35 U.S. C. 102(b) as being anticipated by Shepherd et al.

Only independent claims 39, 41, 43, 58, 60 and 62 are amended herein. The same amendment has been made in claims 39, 41 and 43. A similar amendment has been made in claims 58, 60 and 62. The amendments may be found in the last paragraph of claims 39 and 58 and in the next to last paragraph of claims 41 43, 60 and 62. There is specific support for these amendments in column 3, lines 26-57 of the granted patent and filed reissue application, corresponding to page 5, lines 9-37 of the original specification.

It is respectfully submitted that Shepherd et al. does not disclose or suggest Applicants' invention as set forth in claims 39, 41, 43, 58, 60 and 62. In Shepherd, duplex voice channels are allocated comprising a pair of non-adjacent time slots for effecting a data transaction (see the abstract, lines 1-6). Thus, even if one would say that in Shepherd there would be allocated an asymmetric number of time slots (because under-utilized times slots in one direction can be released for other unidirectional signaling), nevertheless, Shepherd always has allocated for each channel ~~in the uplink~~ and downlink direction of an **equal** number of time slots.

Thus Shepherd fails to teach the feature of the present claims 58, 60, 62 that states: "each uplink logical channel having a

variable number of uplink time slots and each downlink logical channel having a variable number of downlink times slots, the respective number of allocated uplink time slots in an uplink logical channel and downlink times slots in a downlink logical channel being one of an equal number and an unequal number."

Respectively, Shepherd fails to teach the feature of the present claims 39, 41, 43 that states: "each uplink logical channel having a variable number of uplink time slots and each downlink logical channel having a variable number of downlink time slots, the number of allocated time slots in each logical channel being a function of one of a symmetricity and an asymmetricity of the packet data transmission."

It is apparent that Shepherd and the present invention both reserve channels, (called the logical channels) in the present invention. However, in Shepherd a channel reservation or allocation always means allocating a pair of non-adjacent time slots, one in the uplink and one in the downlink for each duplex channel. The present invention, however, allocates channels where the uplink logical channel can have a different (unequal) number of time slots than the downlink logical channel. This makes channel allocation dynamic and provides a more effective usage of capacity than Shepherd, which always reserves pairs of times slots. Thus, the present invention provides the advantage of a more efficient and effective use of the available radio frequency spectrum. It has advantages which Shepherd simply does not achieve.

Thus, it is respectfully submitted that Applicants' invention, as set forth in claims 39, 41, 43, 58, 60 and 62 is patentably

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distinguishable from Shepherd et al. Allowance of these claims is respectfully requested.

Claims 21, 22, 24, 59, 65 and 67 depend from these claims respectively. Claim 40 depends from independent claim 39, while claim 64 depends from independent claim 58. For the reasons set forth above, it is respectfully submitted that these claims are also directed to patentable subject matter.

For all of the foregoing reasons, it is respectfully submitted that all of the claims now present are clearly novel and patentable over the prior art of record. Accordingly, favorable reconsideration and allowance are respectfully requested. Should any unresolved issue remain, the Examiner is invited to call Applicants' Attorney at the telephone number indicated below.

Respectfully submitted,

David Aker

AUGUST 24, 2000

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